

CLAIMS

- 1 1. A subterranean well packer comprising:
 - 2 (a) a tubular mandrel formed about a fluid flow bore;
 - 3 (b) a resilient well sealing element formed about said mandrel and secured
4 thereto at opposite axial ends whereby said element may be expanded to
5 form a fluid seal with a well wall;
 - 6 (c) an expansion chamber between said sealing element and said mandrel;
 - 7 (d) a fluid flow channel between said fluid flow bore and said expansion
8 chamber; and,
 - 9 (e) a fluid flow labyrinth in said fluid flow channel for activating a rheotropic
10 fluid.
- 1 2. A well packer as described by claim 1 wherein said fluid flow channel comprises
2 a one-way fluid flow check valve.
- 1 3. A well packer as described by claim 2 wherein said labyrinth is positioned in said
2 flow channel between said check valve and said expansion chamber.
- 1 4. A well packer as described by claim 1 wherein the fluid flow labyrinth comprises
2 a chamber having a series of baffles disposed therewithin in a substantially
3 parallel relation to define a plurality of fluid flow spaces within the chamber.
- 1 5. A well packer as described by claim 4 wherein each of the baffles contains a fluid
2 flow aperture, each of the fluid flow apertures being misaligned with fluid flow
3 apertures in neighboring baffles so as to create a tortuous flow path through the
4 chamber.
- 1 6. A well packer as described by claim 2 wherein said check valve comprises a ball-
2 shaped valve member that is biased against a valve closure seat.

1 7. A well packer comprising:
2 (a) a tubular mandrel formed about a fluid flow bore;
3 (b) a resilient well sealing element formed about said mandrel and secured
4 thereto at opposite axial ends whereby said element may be expanded to
5 form a fluid seal with a well wall;
6 (c) an expansion chamber between said sealing element and said mandrel;
7 and,
8 (d) a labyrinthine fluid flow path for ingress of fluid into the expansion
9 chamber, the fluid flow path being sufficiently labyrinthine to activate a
10 rheotropic fluid.

1 8. A well packer as described by claim 7 further comprising a one-way fluid flow
2 check valve.

1 9. A well packer as described by claim 7 wherein the fluid flow labyrinth comprises
2 a chamber having a series of baffles disposed therewithin in a substantially parallel
3 relation to define a plurality of fluid flow spaces within the chamber.

1 10. A well packer as described by claim 9 wherein each of the baffles contains a fluid
2 flow aperture, each of the fluid flow apertures being misaligned with fluid flow apertures
3 in neighboring baffles so as to create a tortuous flow path through the chamber.

1 11. A well packer as described by claim 8 wherein said check valve comprises a ball-
2 shaped valve member that is biased against a valve closure seat.

1 12. A method of setting a subterranean well packer comprising the steps of:
2 providing a tortuous flow path for a packer inflation fluid proximate of a packer
3 element inflation chamber; and,
4 inflating said packer element with a rheotropic fluid delivered along said tortuous
5 flow path into said inflation chamber.

1 13. A method as described by claim 12 wherein flow of said rheotropic fluid along
2 said flow path is restricted to one-way flow.

1 14. A method as described by claim 12 wherein the tortuous flow path is provided by
2 a series of baffles disposed therewithin in a substantially parallel relation to define a
3 plurality of fluid flow spaces therebetween within the chamber.

1 15. The method of claim 13 wherein the flow of said rheotropic fluid is restricted to
2 one way flow by a check valve.